

CLAIMS

1. A fluid detecting device comprising:
a main path through which a fluid runs;
one or a plurality of branch paths each having an
5 opening end portion that is formed in the vicinity of an
inner wall surface of the main path so as to point to an
upstream or downstream side of said main path, and causing
part of a fluid flowing in the vicinity of the inner wall
surface of said main path to run therethrough via the
10 opening end portions; and
a thermal flow sensor that is disposed in said branch
path and detects a flow of the fluid running through said
branch path.
- 15 2. The fluid detecting device according to claim 1,
wherein the opening end portions of said plurality of
branch paths, which are pointed toward the upstream side of
said main path, are arranged at regular intervals along a
path cross section of said main path around an axis of said
20 main path.
3. The fluid detecting device according to claim 1,
wherein the opening end portions of said plurality of
branch paths, which are pointed toward the downstream side
25 of said main path, are arranged at regular intervals along
a path cross section of said main path around the axis of
said main path.
- 30 4. The fluid detecting device according to any one of
claims 1 through 3, wherein said branch paths are open at
the other end sides toward a surrounding environment of
said main path.

5. The fluid detecting device according to claim 2, wherein:

the plurality of branch paths whose opening end portions are pointed toward the upstream side of said main path are connected to the other end portions to form one path; and

said thermal flow sensor is disposed in a portion where said plurality of branch paths are connected to one another to form one path, and detects a total flow rate of fluids running through the branch paths.

6. The fluid detecting device according to claim 3, wherein:

the plurality of branch paths whose opening end portions are pointed toward the downstream side of said main path are connected to the other end portions to form one path; and

said thermal flow sensor is disposed in a portion where said plurality of branch paths are connected to one another to form one path, and detects the total flow rate of the fluids running through the branch paths.

7. The fluid detecting device according to either one of claims 5 and 6, wherein an end portion of the portion where the plurality of branch paths are connected to one another to form one path, is open toward the surrounding environment of said main path.

8. The fluid detecting device according to claim 1, further comprising:

an auxiliary thermal flow sensor that is disposed in a portion where said branch paths are not formed, and detects a state of said fluid.

9. The fluid detecting device according to claim 8,
wherein said auxiliary thermal flow sensor is disposed in a
fluid-pooling portion that communicates with said branch
5 paths.

10. A fluid detecting device comprising:
a main path through which a fluid runs;
one or a plurality of branch paths each having an
10 inflow-side opening end portion pointed toward an upstream
side of said main path and an outflow-side opening end
portion pointed toward a downstream side of said main path
which are formed in the vicinity of an inner wall surface
of the main path, and causing part of a fluid flowing in
15 the vicinity of the inner wall surface of said main path to
run therethrough via said inflow-side and outflow-side
opening end portions; and
a thermal flow sensor that is disposed in said branch
path and detects a flow of the fluid running through said
20 branch path.

11. The fluid detecting device according to claim 10,
wherein the inflow-side opening end portions and the
respective outflow-side opening end portions in said
25 plurality of branch paths are arranged at regular intervals
along a path cross section of said main path around an axis
of said main path.

12. The fluid detecting device according to claim 10,
30 wherein the inflow-side opening end portions and the
respective outflow-side opening end portions in said
plurality of branch paths are roughly aligned in a path
direction of said main path.

13. The fluid detecting device according to either one of claims 11 and 12, wherein:

5 said branch paths have a plurality of upstream-side branch paths provided with said respective inflow-side opening end portions, a plurality of downstream-side branch paths provided with said respective outflow-side opening end portions, and a communicating portion disposed between said plurality of upstream-side branch paths and said
10 plurality of downstream-side branch paths to form one path; and

said thermal flow sensor is disposed in the communicating portion that forms said one path, and detects a total flow rate of the fluids running through said branch
15 paths.

14. The fluid detecting device according to claim 13, wherein path resistance of each of said branch paths is greater than path resistance of said communicating portion.

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15. The fluid detecting device according to claim 10, further comprising an auxiliary thermal flow sensor that is disposed in a portion where said branch paths are not formed and detects a state of said fluid.

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16. The fluid detecting device according to claim 15, wherein said auxiliary thermal flow sensor is disposed in a fluid-pooling portion that communicates with said branch paths.